What is claimed is:

1. A method for measuring a radiation dose which comprises the steps of:

applying a target radiation to a dosimeter containing a terbium-samarium co-activated alkaline earth metal rare earth oxide phosphor which is composed of an oxygen atom and a composition of the formula (I):

$$M^{II}M^{III}_2:xTb,ySm \qquad (I)$$

in which M^{II} is at least one alkaline earth metal element selected from the group consisting of Mg, Ca, Sr and Ba; M^{III} is at least one rare earth element selected from the group consisting of Y, La, Gd and Lu; and x and y are numbers satisfying the conditions of $0<x\leq0.1$ and $0<y\leq0.1$, respectively;

and

measuring a variation per unit time of strength of a green light emitted by the phosphor.

2. The method of claim 1, wherein the dosimeter is in the form of a sheet which comprises a support and a phosphor layer containing the phosphor.

3. The method of claim 1, wherein M^{II} in the formula (I) is at least one of Sr and Ba, and M^{III} in the formula (I) is at least one of Y and Gd.

4. The method of claim 1, which further comprises the step of preparing a calibration curve by applying a standard target radiation in a known dose to the same dosimeter, and measuring a variation per unit time of strength of a green light emitted by the phosphor.

Sub C2

Ra2

5. A method of producing a radiation image which comprises the steps of:

applying a radiation having passed through a target or having been radiated by a target onto a radiation image storage panel containing a layer of terbium-samarium co-activated alkaline earth metal rare earth oxide phosphor which is composed of an oxygen atom and a composition of the formula (I):

$$M^{II}M^{III}_2:xTb,ySm \qquad (I)$$

in which M^{II} is at least one alkaline earth metal element selected from the group consisting of Mg, Ca, Sr and Ba; M^{III} is at least one rare earth element selected from the group consisting of Y, La, Gd and Lu; and x and y are numbers satisfying the conditions of $0<x\leq0.1$ and $0<y\leq0.1$, respectively;

determining a variation per unit time of strength of a green light emitted by the phosphor in each pixel which is imaginarily set on the storage panel, to obtain two-dimensional image data for each pixel;

and

producing a radiation image from the obtained image data.

Sub C4

6. The method of claim 5, wherein M^{II} in the formula (I) is at least one of Sr and Ba, and M^{III} in the formula (I) is at least one of Y and Gd.

Ra3

7. A method for measuring a dose of ultraviolet rays which comprises the steps of:

applying a target radiation to a means containing a terbium-samarium co-activated alkaline earth metal rare earth oxide phosphor which is composed of an oxygen atom and a composition of the formula (I):

$$M^{II}M^{III}_2:xTb,ySm \qquad (I)$$

in which M^{II} is at least one alkaline earth metal element selected from the group consisting of Mg, Ca, Sr and Ba; M^{III} is at least one rare earth element selected from the group consisting of Y, La, Gd and Lu; and x and y are numbers satisfying the conditions of $0<x<0.1$ and $0<y<0.1$, respectively;

and

measuring a variation per unit time of strength of a green light emitted by the phosphor.

8. The method of claim 7, wherein the means is in the form of a sheet which comprises a support and a phosphor layer containing the phosphor.

9. The method of claim 7, wherein M^{II} in the formula (I) is at least one of Sr and Ba, and M^{III} in the formula (I) is at least one of Y and Gd.

10. The method of claim 7, which further comprises the step of preparing a calibration curve by applying standard target ultraviolet rays in a known dose to the same means, and measuring a variation per unit time of strength of a green light emitted by the phosphor.

11. A method for measuring a radiation dose which comprises the steps of:

applying ultraviolet rays to a dosimeter containing a terbium-samarium co-activated alkaline earth metal rare earth oxide phosphor which is composed of an oxygen atom and a composition of the formula (I):

$$M^{II}M^{III}_2:xTb,ySm \qquad (I)$$

in which M^{II} is at least one alkaline earth metal element

selected from the group consisting of Mg, Ca, Sr and Ba; M^{III} is at least one rare earth element selected from the group consisting of Y, La, Gd and Lu; and x and y are numbers satisfying the conditions of $0<x\leq 0.1$ and $0<y\leq 0.1$, respectively;

measuring a strength of a green light and a strength of a red light emitted by the phosphor to which the ultraviolet rays have been applied;

applying a target radiation to the dosimeter, so as to cause variation of atomic valency for the terbium and samarium;

applying ultraviolet rays to the dosimeter to which the target radiation has been applied;

measuring a strength of green light and a strength of a red light emitted by the phosphor to which the ultraviolet rays have been applied after application of the target radiation;

and

comparing the former strengths of the green light and red light with the latter strengths of the green light and red light.

12. The method of claim 11, wherein the dosimeter is in the form of a sheet which comprises a support and a phosphor layer containing the phosphor.

13. The method of claim 11, wherein M^{II} in the formula (I) is at least one of Sr and Ba, and M^{III} in the formula (I) is at least one of Y and Gd.

Sub C8

B5 a5

14. A method of producing a radiation image which comprises the steps of:

applying ultraviolet rays to a radiation image storage panel containing a layer of a terbium-samarium coactivated alkaline earth metal rare earth oxide phosphor which is composed of an oxygen atom and a composition of

the formula (I):

$$M^{II}M^{III}_2:xTb,ySm \qquad (I)$$

in which M^{II} is at least one alkaline earth metal element selected from the group consisting of Mg, Ca, Sr and Ba; M^{III} is at least one rare earth element selected from the group consisting of Y, La, Gd and Lu; and x and y are numbers satisfying the conditions of $0<x\leq0.1$ and $0<y\leq0.1$, respectively;

measuring in each pixel which is imaginarily set on the storage panel, a strength of a green light and a strength of a red light emitted by the phosphor to which the ultraviolet rays have been applied, to obtain two-dimensional image data for each pixel;

applying a radiation having passed through a target or having been radiated by a target onto a radiation image storage panel, so as to cause variation of atomic valency for the terbium and samarium in each pixel;

applying ultraviolet rays to the storage panel to which the target radiation has been applied;

determining in each pixel a strength of green light and a strength of a red light emitted by the phosphor to which the ultraviolet rays have been applied after application of the target radiation, to obtain two-dimensional image data for each pixel; and

processing the latter strengths of the green light and red light with reference to the former strengths of the green light and red light in each pixel, for producing a radiation image from the obtained image data.